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DOCUMENT

TOWARDS A NEW PARADIGM FOR SCHOLARLY COMMUNICATION

Discussion Paper prepared by the AUCC - CARL/ABRC Task Force on Academic Libraries and Scholarly Communication

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A Message from the Task Force Chairman

At its October 1994 meeting, the Board of Directors of the Association of Universities and Colleges of Canada endorsed a proposal from the Canadian Association of Research Libraries

that a joint task force be established "to address the crisis of scholarly communication and its effect on higher education in Canada."

The proposal emerged as the result of a clear consensus among members of CARL/ABRC that, given the central role of academic libraries in scholarly communication, the challenges they face must be seen as fundamental concerns of universities. AUCC's board agreed that addressing the issue of scholarly communication is key to the success of the university community as it moves into the next century.

The challenges facing universities include:

- escalating prices for scholarly information, particularly in the sciences;
- an increasing volume of academic information, due in part to university hiring, promotion and tenure practices;
- the ownership of copyrights by private interests; and
- an environment characterized by rapid technological change and growing fiscal restraint.

The challenge for universities is to move steadily towards a new paradigm of scholarly communication. The current paper-based system of scholarly communication, in which libraries acquire resources just in case scholars and students need them, is increasingly difficult for universities and their libraries to support and sustain. The new system should be premised on the principle of just in time services.

The challenges and opportunities presented by fiscal constraint, new technologies and an explosion of information require that universities and their libraries develop a system by which scholars and students can access information when it is needed. Such a system would be network-based, cost-efficient and more timely, while maintaining the values of peer review and protecting the copyright interests of scholars and institutions.

The AUCC - CARL/ABRC task force began its work in January 1995. Composed of university executive heads, vice-presidents academic and member university librarians of CARL/ABRC and the Canadian Association of Small University Libraries (see Appendix 1 for details), the task force is developing priorities for action to ensure that academic libraries can continue to effectively support scholarship in all its forms in Canadian universities.

This discussion paper is the first of a series of papers intended to raise awareness of these important issues, to describe initiatives which have begun to address these issues, and to propose strategies for the short, medium and long-term.

The members of the task force hope that all parts of the scholarly community become engaged in finding constructive approaches

for dealing with the changing environment. Because the issues are complex and the impediments to change could prove difficult to overcome, a total effort on the part of the community is required.

If you have any comments or suggestions, please forward them to the task force:
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Scholarly Communication, Universities and Academic Libraries

Through their extensive collections and services, academic libraries have long been central to the pursuit of pure and applied knowledge throughout the world. They are as essential to scholarship as are laboratories and other research facilities. Early adopters of computer technology, academic libraries are now harnessing the power of the Internet and electronic systems to assist users in locating and obtaining information in all formats. In terms of collections, Canada's university libraries represent an integral part of the national cultural heritage. The libraries of CARL/ABRC institutions hold more than 40 million monographs, and collectively hold just under 40 million volumes of scholarly and popular periodicals (1994 CARL/ABRC Statistics). The libraries of CASUL libraries, for their part, collectively hold approximately seven million monographs and two million serial volumes. It should be noted, however, that these figures do not represent unique titles; particular items are often held by many institutions. Two major players in Canada in scholarly communication are the National Library of Canada and the Canada Institute for Scientific and Technical Communication. Both serve universities and their libraries across the country, and have made significant efforts in moving into the electronic age (see Appendix 2). Academic libraries already store and make accessible large numbers of technical reports, specialized and unique archival collections, microforms, and a growing amount of material in electronic format. Bibliographic resources are also regularly shared among Canadian academic libraries. Cooperation in the development and sharing of networking facilities, a recent example being the creation of NOVANET in Atlantic Canada, is well established. In fact, the operating

paradigm for libraries is moving, slowly but inexorably, from one of ownership of paper-based information to one of accessing resources in multiple formats from various locations. However, the ability of Canadian academic libraries of all sizes to provide access to the world's store of scholarly information is increasingly constrained by a number of factors, most notably the worldwide proliferation and runaway cost of scholarly publications, especially in the sciences, and the limitations of Canadian copyright legislation and copyright practices. In turn, this has an important impact on the role of research within the academic community and on university promotion and tenure practices.

The Nature and Extent of the Crisis in Scholarly Communication

At present, the scholarly communication system Ã which remains largely paper-based Ã prevents universities from exercising control over the very academic information that is generated in large part within their walls. Control of academic publishing lies in the hands of a relatively small number of major publishers whose pricing practices are forcing more and more university libraries to cancel subscriptions to their journals, thus further driving up unit costs for the remaining subscribers. Furthermore, interlibrary loan requests and associated costs are increasing. The issues surrounding scholarly communication are not uniquely Canadian. In fact, academics worldwide are grappling with the challenges (see Appendix 3). But while universities might have been able to work within such a system in the past, it is clear that they can no longer do so. Failure to address the limitations of the current scholarly communication system will have serious repercussions for Canada's knowledge enterprise. Academic libraries would be obliged to continue cancelling their most esoteric and expensive research journals, a trend which would ultimately lead to research collections not keeping pace with scholarly output. Faculty would need to use even more of their research budgets for obtaining increasingly costly scholarly materials.

Characteristics of the Current Model

Format:
Almost totally paper-based with some facsimile publication through CD-ROM technology as a by-product of paper publication. Limited electronic publication of scholarly journals arising primarily from new disciplines and multidisciplinary activities.

Capacity:
Limited by the paper format and by the costs of the format, particularly high quality illustrative materials.

Control:
Content generated almost totally by academics with the costs borne totally by creators, institutions and organizations and by various granting agencies and foundations. Commercial

publishers of scholarly journals normally require the surrender of the scholar's total copyright interest in an article as a condition of publication. Quality controlled largely by voluntary editorial panels and by readers who assess and rank submissions.

This peer review process is viewed as the single most important element in establishing the value of a journal and is usually an outright gift to the publisher from the scholarly community. Business aspects of a commercial scholarly journal totally controlled by the publishers who decide how much will be published, when, with what degree of illustration and the sale price.

Costs:
Complete unpredictability; escalating rapidly; costs of interlibrary loan services increasing.

Timeliness:
Distribution slow because of capacity limitations and the practicalities of a distribution system based on printing and the postal service.

Worldwide Proliferation and Runaway Costs

A recent landmark study of the economics of research libraries concluded that ". . . in the 1970s and 1980s, the rate of increase in volumes added at university research libraries virtually halted, while domestic and international publishing continued to produce greater and greater numbers of new titles each year." (Anthony M. Cummings et al, University Libraries and Scholarly Communication (New York City: Andrew W. Mellon Foundation, 1992, p xviii) The study further showed that serial prices, particularly for scientific journals, drive what has been described as the crisis in scholarly communication. CARL/ABRC is working with CASUL and the National Library of Canada to gather comprehensive statistics on the impact of these developments on Canadian academic libraries. Until this information becomes available, however, it is necessary to rely on the findings of the U.S.-based Association of Research Libraries, which nevertheless has 15 Canadian members, to illustrate these impacts in the North American context. The 1993-94 ARL statistics show the following trends since 1986:

- large increases in serial and monograph costs (up 115 per cent for serials, 55 per cent for monographs);
- declining acquisitions of serials and monographs (down 4 per cent for serials, 22 per cent for monographs);
- more spending on serials and monographs (since 1986, ARL libraries have spent 93 per cent more on serials while buying 4 per cent fewer of them, and 17 per cent more on monographs while buying 22 per cent fewer. This occurred during a period when the number of users increased significantly Ä 10 per cent more students, 16 per cent more

faculty Ä and per-student staffing levels decreased.)

There are many factors that contribute to the proliferation of scholarly works and their rising costs. Current practices in academe, such as hiring, promotion, tenure, and granting procedures, tend to favor the generation of increasing amounts of scholarly literature. Moreover, to be officially recognized and systematically communicated, scholarly works must be published, ideally in the most respected refereed journals. Journal practices, in which publishers typically insist that authors assign copyright of their works to them, also contribute to the problem. Scholars, more intent on promulgating their ideas than enjoying commercial gain, agree to give up their rights in return for publication. Most prestigious academic journals are published by a small group of powerful European companies. In the absence of competition for their extremely specialized products, these publishers have the power to set prices according to what the market will bear. At the same time, the economic environment is characterized by static or decreasing library budgets. Academic libraries throughout the world are being obliged to systematically cancel subscriptions and/ or forego the purchase of new material, thus leading to a steady deterioration of their collections.

Imitations of Canadian Copyright Law

Canada's current copyright law Ä and the delays and confusion surrounding copyright reform Ä also add to the difficulties facing academics who wish to communicate their scholarship and research the work of colleagues. Given the increasing commercialization of information and the ease with which documents can be reproduced using modern technology, it is not surprising that copyright has become the central focus of a debate between information creators and the users of their work. At issue is the need for a fair and balanced copyright law which respects the legitimate desire of copyright owners for a reasonable economic return on their works with the equally legitimate need of users to freely exchange ideas, as well as the public good of advancing knowledge through scholarship. Also at issue is the ability of our copyright law to adapt to the rapidly changing electronic environment. Unfortunately, the 1988 revisions to the Canadian Copyright Act tipped the scales significantly in favor of creators' rights. It is essential for the future of scholarly communication that this imbalance be corrected in the upcoming Phase II copyright law revisions. Certainly, the copyright laws of the United States, the United Kingdom, Australia and other countries recognize that, under a number of well-defined circumstances, the reproduction of copyright material is in the public interest and is therefore not subject to the payment of royalties. In Canada, this is known as "fair dealing." In the absence of reasonable provisions of similar scope in Canada, including guidelines around fair dealing, the free flow of ideas which is essential to scholarly pursuits and scientific advancement will be curtailed and Canadian academics will find themselves seriously disadvantaged in comparison to their

foreign colleagues. The 1988 copyright law reforms also sanctioned the creation of copyright collectives, institutions that collect royalties on behalf of a group of copyright holders, usually publishers. Most universities have now either entered into an agreement with a collective directly for the copying of print material or, as is the case in Quebec, are covered by an agreement negotiated between the collective and the provincial government. While providing a number of benefits to the university community, these agreements leave unresolved the most central and controversial issues in the copyright area, including the debate over the scope of fair dealing in Canada. In addition, these agreements are by and large silent with respect to the making of electronic copies of copyright works. And, while agreements between the CANCOPY collective and universities outside Quebec cover the copying of journal articles and other print material for use in interlibrary loan, the entire area of interlibrary loan remains the focus of much controversy. For the university community, unrealistic limits on interlibrary loans, exorbitant royalty payments or unmanageable royalty payment schemes would have disastrous consequences for the entire scholarly communication system. Thus, it remains of critical importance that impending copyright reform add clarity to these pivotal issues through specific library and educational exceptions and/or a clear definition of fair dealing equal in scope to that found in the copyright legislation of Canada's major trading partners. Unfortunately, copyright reform has been so slow and arduous a process that, by the time the long-awaited Phase II legislation takes effect, Canada will be long overdue for copyright law that addresses the realities of the new electronic information age.

An Emerging Paradigm

Many observers believe that the concept of the "virtual library" Ă which harnesses the power of the personal computer to create an open system accessible to anyone, anywhere, at any time Ă represents the future for scholarly communication. Any new system that seeks to replace the current paper-based scholarly communication system will be expected to:

- restore scholar centricity, and be controlled by scholars and their institutions

  Given the opportunities presented by new technologies and the fiscal pressures facing universities and their libraries, universities and academics can increasingly provide the services currently offered by commercial publishers. This would allow scholars to perform their functions in a more cost-efficient and timely manner.

- be network-based

  The new scholarly communication system will inevitably be

based on the capabilities of a network, or series of networks, like the Internet and its successors. It also assumes a fairly ubiquitous electronic environment on campuses, which will be used for many purposes in addition to scholarly communication. In this sense, it is important that educational institutions maintain affordable, dedicated access to the information highway.

As a significant by-product of the transition to such a system, the widespread application of hypertext linkages will allow dynamic referencing between publications and other resources, thus providing scholars with immediate access to supplementary information.

- be unlimited in its capacity, and able to support all formats

  A new model should seek to neutralize the limitations of the current artificial ceilings on how much information may be "published", either in total or at any one time. While the academic community will probably establish norms, these would be based on scholarly, not economic or technological, criteria. The system would support such features as full color illustrations, linked data files, sound, video and animation, and could accommodate all languages by providing a wide variety of fonts, characters and symbols.

- protect the copyright interests of both scholars and institutions

  Institutions must revisit the current model in which they forgo or ignore their statutory ownership of scholarly output. The new model could still yield to the interests of the scholar, but might require automatic granting of non-exclusive licences for using the intellectual property within an institution, within a group of institutions, or within the national or international scholarly community.

- be responsive to the values of peer review

  Peer review is greatly valued in the current system of scholarly communication as a mechanism for both quality and quantity control. However, it might be possible to see it less as an absolute prerequisite for publication, and more as a value that can be added to a scholarly work as it progresses through the new system.

- base prices on the actual direct costs to the providers, and be predictable in costs both to authors and subscribers

  The new system will not be free, but significant costs can be removed entirely (e.g. paper, printing, packing, postage and profit). Since neither volume of material nor volume of subscribers will significantly drive costs, there should be

higher predictability in costs and pricing.

- be timely

  A scholar-controlled, networking-based scholarly communication system should significantly neutralize current delays between the submission of a learned paper and its appearance in final form. There will be no artificial gathering of information in "issues" or "volumes"; submissions can be "published" when ready; and delivery will be almost instantaneous.

- provide the tools to create, convert, and organize the information available through it

  Both the mass and the complexity of materials on the system will require new tools to address such requirements as:

  - the seamless conversion of information from the scholar's workstation to the network;
  - the identification and extraction of resources germane to a particular scholar or group;
  - the making of comprehensive and consistent citations to network-based resources; and
  - the process of indexing and abstracting in the networked environment.

The inescapable conclusion of these characteristics is that all institutions in the current scholarly communication system Ä computer centres, libraries, publishers, scholars, and universities Ä must be prepared not only to accept, but to drive major changes to their operations in order to realize the advantages of the new model. It is equally true that the current system has been in place for many years, and is unlikely to change easily or quickly. However, the combined pressures of economics, technological change and increased demand for plentiful, accurate and timely information will ultimately overcome this inertia. The challenge for the university community is to channel these forces so as to the maximize the benefits of inevitable change.

Moving Toward the Future

A number of projects are already under way across Canada, both among the academic community and by the federal government, that begin to address the needs of an emerging scholar-centred communication system. New technologies are being put in place, new partnerships forged. Meanwhile, a series of moves on a number of fronts are refreshingly positive.

Copyright Initiatives

- In a December 1994 press conference, the Minister of Canadian Heritage indicated that exceptions for archives, non-profit educational institutions, libraries, museums and the visually handicapped would be included in the proposed Phase II legislation. However, the extent of these exceptions is not known and the timing of the bill's introduction remains unclear.
- The Information Highway Advisory Council, established by the federal government in April 1994 and chaired by David Johnston, former principal of McGill University, released its final report for consideration by the government in the fall of 1995. The IHAC report recommended that specific criteria and guidelines regarding the scope of the fair dealing exception be provided in the Copyright Act, including explicit clarification that fair dealing applies to the making of an electronic copy of a work and to the storage and transmission of that copy by electronic means. IHAC also recommended that it should be left to the owners of copyright works to determine when and whether browsing of their works on the information highway should be permitted, that copyright owners should identify what part of their works would be appropriate for browsing, and that the terms "browse" and "publicly available work" be defined in the Copyright Act.
- Nine provinces and the two territories issued a statement on copyright in February 1995 which highlighted the need for copyright legislation to achieve a balance between the rights of creators and the rights of society to gain fair access to protected works for educational purposes. (Quebec was not a signatory to the statement). The statement supports the need for a clear definition of fair dealing in the Copyright Act and the need for the legislation to state clearly that fair dealing also applies to the making of an electronic copy of a work and to the storage or transmission of a work by electronic means.

Federal Government Inititatives

- The Virtual Products Directorate of Industry Canada is creating an Electronic Journals Development Program aimed at stimulating the conversion of paper journals and fostering the creation of new electronic publications.
- Industry Canada is supporting SchoolNet, an initiative with the cooperation of provincial and territorial governments and First Nations leaders, to provide Canadian teachers and students with electronic services to stimulate the skills needed in the global information economy. Public libraries and universities are regarded as key partners in this initiative.

- CANARIE (Canadian Network for the Advancement of Research, Industry and Education) is supporting many networking projects, among them CultureNet, an initiative of the University of Calgary, the Canadian Institute for Theatre Technology and the Canadian Conference of the Arts. CultureNet is designed to serve as a central electronic site for information on Canadian cultural activities.
- The National Library of Canada recently announced an Electronic Publications Pilot Project aimed at examining different means by which Canadian electronic publications can be deposited at the National Library, catalogued, stored and made accessible. Issues such as copyright, security, royalties, billing and technical standards will also be addressed. The result of the three-month pilot will be a report that will assist the National Library and libraries across the country in developing policies and procedures concerning electronic publications.
- The Canada Institute for Scientific and Technical Information recently developed IntelliDoc, a high-speed, high-volume automated system that integrates all aspects of the document delivery process. In 1995, IntelliDoc began to be used for responding to the half million document requests processed annually by CISTI. IntelliDoc incorporates a custom-designed image scanning workstation to handle electronic scanning of document pages and the creation of digital images. IntelliDoc sends the scanned images directly to clients via a fax modem, over the Internet or to an Ariel workstation. High-speed laser printers can also generate high quality paper copies from IntelliDoc images. IntelliDoc leverages Canada's investment in worldwide scientific and technical information and makes information accessible rapidly and cost-effectively to clients.

University Initiatives

- Ten of the largest CARL/ABRC libraries, the National Library of Canada and CISTI have developed a proposal for a Canadian digital library system (the CAN-LINKED initiative), in the hope of obtaining funding from the federal government for special projects in Canada's university libraries. Major projects include the digitization of selected existing collections, electronic publishing, and the development of network navigation tools such as directories.
- The Council of Prairie and Pacific Libraries has initiated an inter-institutional library resource sharing program.
- The "Data Liberation Initiative", based on CARL/ABRC's successful Data Consortia project, has been launched by the Social Science Federation of Canada. The initiative represents a cooperative effort between Statistics Canada, the Depository Services Program of Public Works and

Government Services and the academic community. It aims to provide affordable access to statistical microdata files in electronic form, thus extending electronic democracy.

- Individual universities have also undertaken key initiatives. For example, many have passed or are considering adopting resolutions stating that no new course or program will be approved until funding has been committed for the necessary library materials. Such resolutions promote awareness of the increasing costs of providing bibliographic support to scholarship.
- CARL/ABRC is exploring the possibility of a partnership arrangement with CISTI related to collection rationalization, document delivery and resource sharing that would ensure access to the institute's services at preferential rates, coupled with access by CISTI's clients to the collections of CARL/ABRC libraries.

Some Obstacles to Reform

The road to reform will not be easy. While "construction" of the virtual library may well solve many of the challenges facing academics in their efforts to share scholarly information, it is clear that the reality of a worldwide, fully linked and fully digitalized information base is still far in the future. For the foreseeable future, the virtual library is an unrealistic solution.

The Association of American Universities' Research Libraries Project, for example, has predicted that only 20 per cent of published scientific, technical and medical information will be available in a fully electronic mode by the year 2015. A full 50 per cent of the published output in these areas is expected to remain in paper form. Furthermore, predictions of the rapid demise of the current bibliographic system do not always address such crucial issues as editorial standards, the high cost of retrospective digitization and database maintenance, reliable distribution and access mechanisms, user acceptance of the technology, charging and copyright, information integrity, and archiving.

Another option, which would see universities cooperate more fully with national institutions such as the National Library of Canada and CISTI in order to obtain more systematic access to their collections, technologies and expertise, is under way. However, in light of the many financial uncertainties facing government departments and agencies at present, this option is likely to become increasingly difficult.

In addition, there are internal academic pressures that could well delay a virtual solution. Although university librarians support the digitization of their collections, it is clear that "academic pride" is still intrinsically linked with the size of library collections.

The collections of academic libraries are driven by the

information needs of their institutions. Because the vast majority of published scholarly information today is available only as a commercial commodity, and almost exclusively in a paper format, libraries are still obliged to purchase and house materials such as monographs and serials. And because there is much overlap among postsecondary institutions in terms of faculties and programs, there is corresponding duplication in their library collections.

Any attempt to rationalize these collections to implement a system whereby certain libraries agree to take responsibility for building "centres of excellence" in one or more subject areas on which the institutions in a given region (or perhaps the entire country) could rely, must address the realities of the university tradition.

For better or worse, "volume of material held" is a cherished measure of library quality and is likely to remain so for some time. Libraries participating in a coordinated collection rationalization process would no doubt save on collection costs, but their total volume counts would not rise as quickly as those not involved in such schemes. New measures are needed to assess libraries not only on their physical contents, but on their ability to identify and provide information held outside of their walls. In addition, faculties whose research collections would be located at institutions other than their own would doubtless have concerns with any such move, and might insist on maintaining various special collections. And there are concerns Ä and many questions Ä about moving to electronic publications. Would this put quality at risk? How will the peer review system be maintained? Will publications in electronic journals be accorded the same status and recognition as print journals? Can the textual integrity of electronic journals be maintained? Will an archiving system ensuring the preservation of electronic journal articles be developed? And will electronic journals actually produce financial savings?

The savings derived from not purchasing materials in certain subject areas might be offset by increased document delivery costs and the impact of higher costs of interlibrary loan would be felt on library budgets. In fact, the ARL estimates that the average cost of an interlibrary loan transaction is more than $30 U.S. As the study that developed this statistic included eight of the 15 Canadian members of ARL, it is likely that Canadian costs would be at least as high. Perhaps most importantly, it is likely that publishers of the cancelled material might counter the negative impact on their market share by raising subscription rates even higher.

Moving Forward

In order for Canadian universities to successfully face the scholarly communication crisis, the Canadian university community, governments, the private sector and other concerned

groups must take concrete steps in the move towards the emerging paradigm. A united effort will allow Canada to more successfully perform in the knowledge economy by more effectively supporting the country's R&D enterprise and by becoming a world leader in developing and harnessing the many powers of the information highway.

Failure to do so means that Canada risks falling behind in a vigorously competitive global economy in which knowledge is seen increasingly as a key factor of production.

To enhance Canada's efforts in adapting to the imperatives of the new economy, the AUCC-CARL/ABRC task force believes that action is required in the following areas:

In the short term, it is necessary to:

- enhance awareness of the problems created by the existing scholarly communication system, which is deeply entrenched, and galvanize the academic community around certain actions to address these problems. For example, the most prestigious journals in many fields are also the most expensive, and it is an honour for professors to be asked to sit on their editorial boards; and
- continue work in the area of copyright reform, particularly as it applies to the reproduction and networking of electronic information. Concepts such as "fair dealing" must survive the transition from print to electronic media, while a watchful eye must be kept on the efforts of publishers and their collectives to limit or eliminate legitimate legislative exceptions.

In the medium term, it is necessary to:

- review hiring, tenure and promotion practices in universities to assess their impact on scholarly communication practices;
- review the intellectual property policies of universities and academic publishers to ensure that they best promote the transition to the emerging paradigm. Such policies should address how the Canadian academic community can retain the highest possible degree of control over its intellectual property while at the same time maintaining its ability to publish where it sees fit;
- promote partnerships which apply new networking technologies to scholarly communication. These partnerships should include the university libraries, the academic staff, the computer centres, and the university presses, as well as scholarly societies, the publishing community, the federal government and organizations in other countries;
- make Canadian academic library statistics more comprehensive, consistent and comparable so that a better picture of trends and problems can emerge. Complex as

this undertaking will be, it is important that these statistics measure access capabilities and not simply resources and inputs. Particular emphasis should be placed on developing methods for measuring and assessing the impact of serials cancellations and the explosive growth and use of networked information. Better statistics will also allow for improved forecasting and retrospective analysis;

- encourage, fund and support current and future initiatives and proposals, such as those exploring the development of electronic journals; and
- promote efficient resource-sharing between universities in Canada and abroad.

The long-term goal is the establishment of a decentralized, network-based publishing system, controlled by universities themselves, that retains the best practices (e.g. peer review) and eliminates the worst (e.g. excessive pricing) of the old.

It should be recognized that such a system may not save very much money, even in the long run; for example, resources would be necessary to upgrade and maintain campus computing infrastructures. However, if properly designed and operated, such a system could provide a credible alternative to one already in danger of collapse, and promote a far higher level of information resource sharing than is possible at the present time.

Appendix 1

AUCC - CARL/ABRC Task Force on Academic Libraries and Scholarly Communication

AUCC representatives:
Murray Fraser, President,
The University of Calgary (Chairman)
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The University of Manitoba
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Rosemary Cavan, Corporate Secretary, AUCC
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Appendix 2

The Role of the National Library of Canada

The National Library serves Canadian academic libraries and their clients in many ways. It plays an important role in coordinating an infrastructure for resource sharing. It contributes significantly to the flow of scholarly information through direct services such as the maintenance of the national union catalogue (which contains some 9 million bibliographic records of holdings of Canadian libraries), location and interlibrary loan services (approximately 130,000 requests for interlibrary loan are received annually at the National Library), and the Canadian Book Exchange Centre.

The library's collections of the Canadian imprint in all published formats and Canadian material published abroad are the largest and most important in the world. Centres of emphasis are being built for Canadian literature, music and history. There are now more than 14 million items in the collections. Legal deposit permits the library to build these comprehensive collections while simultaneously ensuring the completeness of the national bibliographic record of materials published in Canada. These bibliographic records, together with union catalogue and source file records, are available through the library's automated database, AMICUS, which can be accessed at more than 670 institutions across Canada. The library continues to collect the results of graduate research through its Canadian Theses Program.

The Role of CISTI

Canadian academic libraries and their users are fortunate to have access to CISTI, the Canada Institute for Scientific and Technical Information of the National Research Council of Canada. CISTI maintains the largest collection of published information in science, technology and medicine in North America, including approximately 16,000 serial titles, 2 million technical reports and 500,000 monographs. CISTI provides a national scientific and technical information (or STI) service with electronic ordering and document delivery, on-line database services, and reference and

expertise-based assistance to clients in Canadian industry, government and universities.

Although subsidized by the Canadian government, CISTI's services are not free, and in recent years the institute has moved closer to a cost recovery model. To leverage Canada's investment in CISTI's STI resources and services, CISTI is marketing its document supply capability to U.S. clients. This strategy aims to increase cost recovery and maintain the breadth of information services to its Canadian clients.

CISTI is also a scholarly publisher. NRC's 14 peer-reviewed research journals attract both international authors and a wide readership in Canada and other countries. Most editors of NRC journals are in Canadian universities. An NRC monograph program has been launched.

Appendix 3

Academic Library Studies in the U.S. and the United Kingdom

The scholarly communication crisis is a global phenomenon, and other countries have been grappling with the complex problems it has generated. Much of relevance to the Canadian situation can be drawn from the two recent initiatives described below, as the high degree of similarity between the issues facing academic libraries is apparent.

Association of American Universities Research Libraries Project (1992-94)

In 1992, the AAU, in close collaboration with ARL, initiated the Research Libraries Project. The project explored the opportunities electronic communication and computer-based networks present: whether they can be used to address the economic pressures universities and their research libraries face, and whether they can improve access to information and the dissemination of scholarly knowledge while reducing the costs of access. In its report on the project, AAU stated that universities have to become involved in shaping this new environment, designing options and systematically implementing them. The project made a series of recommendations, via its three task forces, which were unanimously endorsed by AAU members in April 1994. (The three task forces were: Acquisition and Distribution of Foreign Language and Area Studies Materials; A National Strategy for Managing Scientific and Technological Information; and Intellectual Property Rights in an Electronic Environment.)

Recommendations of note include:

- building consensus on campus about intellectual property in an electronic environment, and bringing other

organizations into the process. As well, the ramifications of fair use rights and the feasibility of retaining certain intellectual property rights in the not-for-profit sector should be explored;

- introducing more competition and cost-based pricing through not-for-profit organizations into the marketplace for scientific and technical information, and exploring the implications of alternative (particularly electronic) publishing outlets;
- improving access to and delivery of international research resources; and
- ensuring that electronic networks can provide adequate access to distributed research collections and support new methods of scholarly inquiry, within the parameters of legal and regulatory frameworks and funding constraints.

Implementation efforts are now beginning, and are likely to be ongoing. These include:

- creating a 10-member AAU/ARL Research Libraries Steering Committee to oversee this process. One of the AAU representatives is Robert Prichard, president of the University of Toronto. The committee held its second meeting in the spring of 1995;
- creating an ongoing task force on intellectual property; and
- conducting several demonstration projects, including a project making the tables of contents of Latin American journals available on the Ariel document delivery system, and the digitization of Mexican Presidential documents. Other projects await funding.

Joint Funding Council of the United Kingdom's Libraries Review Group (1992-93)

This undertaking arose from a concern that library facilities were not adequate to cope with the major expansion in undergraduate numbers that the U.K had experienced in recent years. It was charged with investigating the future national needs for the development of library and information resources including operational and study space requirements for teaching and research in higher education institutions, and identifying ways to meet those needs.

The 83-page Follett Report makes more than 45 specific recommendations in such areas as copyright, electronic documents, library spending, networking, performance indicators, space management, and staffing. Recommendations of note include:

- a major initiative for funding extra space in university and college libraries (œ 140 million) over three years, of which institutions would be expected to pay two-thirds;
- a further investment of œ 20 million over the next three years to develop the potential of information technology in

higher education libraries. Support should be provided for the production, evaluation and distribution of electronic documents, including digitized versions of existing publications, or entirely new electronic journals or document delivery systems. Academic institutions are urged to review the provision of their local area networks to ensure that they will be of sufficient capacity to take advantage of higher bandwidths. Funding for network navigation tools and enhanced campus-wide information servers is also recommended, as is a national training program in information technology;

- a maximum of œ 10 million to be earmarked to enhance collections at specialist centres, particularly in the humanities; and
- increased cooperation and sharing of resources between institutions.

The report stressed the need for the development of institution-wide information strategies which do not focus simply on libraries. Libraries must work with other units to ensure that the information needs of faculty and students are met, reflecting the latest developments in information technology and the organization of research and teaching. There was also a suggestion that the Committee of Vice-Chancellors and Principals, the equivalent of AUCC in the U.K., cooperate with the Association of American Universities and other appropriate U.S. bodies "to find practical and effective ways of influencing the periodical (i.e. scholarly journals) markets in a manner which provides value-for-money for periodical purchases and a fair return for publishers."

Major funding has been earmarked in the U.K. for new library buildings and information technology projects, and a new committee has been formed to address copyright issues.

Suggested Readings

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University of Manitoba. Proceedings of the 1993 International Conference on Refereed Electronic Journals. Winnipeg: University of Manitoba, 1994.

Internet and UseNet newsgroups of interest:
can.infohighway (the Canadian information highway)
ala-wo (includes copyright)
cni-copyright
cpi-l (includes copyright)
pacs-l (automated library systems)
vpiej-l (electronic journals)

Listserver of interest:
* Edupage (information technology in higher education).
To subscribe, send the message "subscribe edupage your name" to "listproc@educom.unc.edu"

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The Canadian Association of Research Libraries / L'Association des bibliotheques de recherche du Canada was established in 1976 and consists of 27 university libraries plus the National Library of Canada and the Canada Institute for Scientific and Technical Information. Membership is institutional, and is open primarily to libraries of Canadian universities which have doctoral graduates in both the arts and the sciences. CARL/ABRC is an associate member of the AUCC.

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